

[0033] In particular embodiments, the gaming machine may further comprise game logic for 1) rendering one or more 2-D images derived from the 3-D gaming environment for a bonus game outcome presentation, 2) generating a sequence of symbols from the virtual reel strips as a function of time in the 3-D gaming environment and for rendering 2-D images from the 3-D gaming environment comprising the sequence of symbols and 3) generating a motion of the one or more virtual slot reels in the 3-D gaming environment. When a sequence of 2-D images capturing one or more the virtual slot reels at various positions in the 3-D gaming environment is viewed on the display screen, the virtual slot reels may appear to move on the display screen. In particular, the symbols on each virtual slot reel may appear to move along a straight line from the top of the display screen to the bottom of display screen.

[0034] In other embodiments, the gaming machine may comprise information for generating geometry of the one or more virtual slot reels in the 3-D gaming environment where the geometry is one of a flat strip or a curved strip. Further, the gaming machine may further comprise one or more virtual reel strips for mapping symbols to the one or more virtual reels and determining a game outcome for the game of chance. For instance, three virtual slot reels and their motions or five virtual slot reels and their motions may be modeled in the 3-D gaming environment.

[0035] In particular embodiments, the gaming machine may also comprise a graphical processing unit, separate from said master gaming controller, designed or configured to execute the graphical operations used to render one or more two-dimensional images derived from the 3-D gaming environment or an input mechanism designed or configured to receive an input signal used to change one of a position or a movement of the one or more virtual slot reels in the 3-D gaming environment. The input mechanism is selected from the group consisting of a keypad, a touch screen, a mouse, a joystick, a microphone and a track ball.

[0036] Another aspect of the invention pertains to computer program products including a machine-readable medium on which are stored program instructions for implementing any of the methods described above. Any of the methods of this invention may be represented as program instructions and/or data structures, databases, etc. that can be provided on such computer readable media.

[0037] These and other features of the present invention will be presented in more detail in the following detailed description of the invention and the associated figures.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0038] FIG. 1 is a perspective drawing of a 3-D virtual gaming environment implemented on a gaming machine for one embodiment of this invention.

[0039] FIG. 2 is a perspective drawing of virtual slot reels in a 3-D virtual gaming environment implemented on a gaming machine for one embodiment of this invention.

[0040] FIGS. 3A-3C are diagrams showing a mapping of virtual reel strip to a 3-D object for one embodiment of this invention.

[0041] FIGS. 3D-3E are diagrams showing movement patterns of a 3-D object used to display a virtual reel strip.

[0042] FIGS. 3F-3G are diagrams showing a display of a sequence of symbols from a virtual reel strip using a 3-D object in a 3-D gaming environment.

[0043] FIG. 4 is a block diagram of a parameterized 3-D model for a flat reel or round reel for one embodiment of this invention.

[0044] FIGS. 5A-5B are a perspective drawing of a 3-D wheel model and 3-D sphere used to display symbols on a virtual reel strip of the present invention.

[0045] FIGS. 6A-6C are diagrams of 3-D virtual gaming environments used to display symbols on virtual reel strips.

[0046] FIG. 7 is a perspective drawing of a gaming machine for one embodiment of the present invention.

[0047] FIG. 8 is a flow chart depicting a method for generating a game of chance using a virtual gaming environment.

[0048] FIG. 9 is a flow chart depicting a method for generating a game presentation using a virtual reel strip in a 3-D virtual gaming environment.

[0049] FIG. 10 is a block diagram of gaming machines that utilize distributed gaming software and distributed processors to generate a game of chance for one embodiment of the present invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0050] FIG. 1 is a perspective drawing of a 3-D virtual gaming environment 100 implemented on a gaming machine for one embodiment of this invention. The 3-D virtual gaming environment may be used by the master gaming controller on the gaming machine to present a game of chance. The game of chance played on the gaming machine may include: 1) a wager selected by a player playing a game on the gaming machine, 2) an initiation of the game of chance on the gaming machine by the player, 3) a determination of an outcome for the game of chance by the gaming machine and 4) a presentation on the gaming machine of the game outcome to the player. In the present invention, the 3-D gaming environment may be used to present a game outcome to the player, describe operating functions of the gaming machine and provide an interface for obtaining gaming information and services. In particular, methods and apparatus of displaying a sequence of symbols, such as a sequence of symbols on a virtual reel strip, in a 3-D gaming environment are described. The sequence of symbols may be applied to different 3-D objects in the 3-D gaming environment, such as but not limited to flat reel segments or rounded reel segments, for generating a game outcome presentation for a game of chance or a bonus game. Apparatus and methods implementing these features are described with respect to FIGS. 1-10.

[0051] In particular FIGS. 1-10 provide the following information. In FIG. 1, a 3-D gaming environment of the present invention is described. In FIG. 2, 3-D reels in the 3-D gaming environment are described. In FIGS. 3A-3F, 4, flat and rounded reel segments used to display symbols in 3-D gaming environments of the present invention are discussed. In FIGS. 5A-5B, embodiments of 3-D wheels and 3-D spheres for displaying symbols that may be used in a generating a game outcome presentation for a game of